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PHLEBITIS OF THE LATERAL SINUS.

DEATH FROM PYÆMIA.—AUTOPSY.

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By J. ORNE GREEN, M.D.,

BOSTON.

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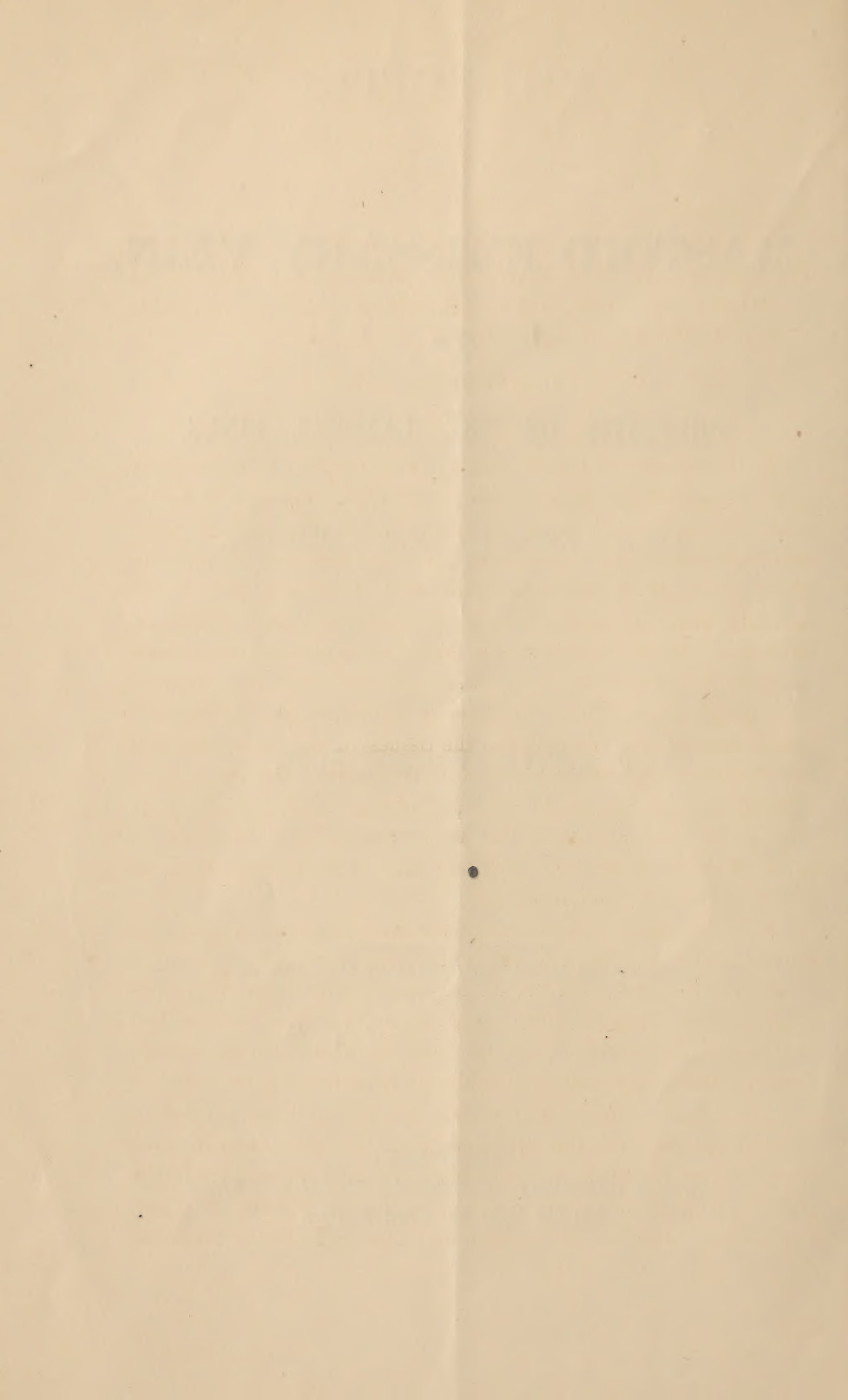
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PHLEBITIS OF THE MASTOID EMISSARY VEIN, FROM  
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By J. ORNE GREEN, M.D.,

BOSTON.

IN the number of this journal for July, 1879, I reported three cases, characterized by early and prominent symptoms in the tissues of the neck (tenderness, induration, and swelling), which, taken together with the later symptoms, led to the diagnosis of phlebitis and thrombosis of the emissary mastoid veins, secondary to the same disease in the lateral sinuses, of which the emissary veins are branches. All of the cases were fatal, but in none of them was it possible to confirm the diagnosis, as autopsies were not obtained. The point of great practical interest in these cases was the early appearance of the symptoms in the tissues of the neck, which, if the diagnosis of inflammation of the emissary vein was correct, obliged us to give a very doubtful prognosis, even before any symptoms in the general system had shown themselves. The histories of all of the cases pointed to inflammation of the tympanum as the origin of the fatal complications.

Since reporting these cases I have had under my care another one, in which the diagnosis was confirmed by autopsy.

Nellie T., aged nineteen, single, entered the Boston City Hospital on Nov. 19, 1879. As long as she could remember there had been a slight discharge from the right ear, which still continued; formerly there had been also discharge from the left ear, but this had been healed for several years. There had been no pain or other symptoms than the discharge from the right ear till three weeks before entrance, when she began to have severe pain in the right ear. Eight days before admission she had attacks of vomiting, always preceded by vertigo, and this had recurred several

times. Four days before, in addition to the severe pain in the ear itself, a severe "throbbing" pain in the top of the head, with more or less pain over the right side of the scalp, set in, and continued constantly.

Physical examination of the heart, lungs, and organs of the abdomen showed them all healthy.

Nov. 20th. Chill last night, but slept pretty well. Another chill this afternoon; much pain in the top of the head.

R. Chloral hydrate.....gr. xv.

Morphiæ sulphatis.....gr.  $\frac{1}{8}$ . M. At 6 P.M.

Nov. 21st. At the request of Dr. C. E. Stedman, I saw her with him, and found the following condition: a profuse, offensive discharge from the right meatus; more or less destruction of the right drum-membrane, but the meatus and deeper parts were so much swollen that the exact condition could not be determined. There was great tenderness in the bone of the right mastoid upon pressure, and very slight œdema of the soft parts over the bone; there was also great tenderness and slight œdema along the edge of the skull for three inches backwards from the mastoid, and for a short distance down the neck; no fluctuation anywhere. The most tender point was behind the mastoid, over the exit of the emissary vein through the skull. The only complaint was of pain in the ear and at the top of the head; this was evidently severe. The strength was good and sensorium unaffected; the pulse was 100, and the temperature  $101^{\circ}$  in the axilla; watch r.  $\frac{0}{98}$ ; no subjective noises.

The diagnosis of chronic purulent inflammation of the tympanum, with probable caries, and with undoubted inflammation of the mastoid, was made. At the same time it was stated that probably inflammation of the lateral sinus, and of the mastoid emissary vein had already occurred as a secondary affection.

Perforation of the mastoid cells was advised, and, being agreed to by the patient, was done under ether. An incision one and a half inches in length was made half an inch posterior to and parallel with the auricle down to the bone. No pus was found, and the bone was perfectly sound. With a triangular borer three-sixteenths of an inch in diameter the cells were then easily per-



forated, the external mastoid wall being very thin. No pus was evacuated, but, on passing in a bent probe, the thin partition-walls between the cells were found to be so softened that they were felt to break down under the probe, and a small amount of grumous material was syringed out. Water passed with perfect freedom into the wound and out of the meatus. She was ordered a warm carbolized douche through the mastoid and tympanum, twice a day, and opiates as before, if necessary, for the pain.

Nov. 22d. There was much less pain in the head.

Nov. 23d. Had slept well, except a chill at 2.30 A.M. of short duration. Still less pain in the head, and the œdema and tenderness over and behind the mastoid were very much diminished. Diet entirely of milk, of which she takes five pints daily.

Nov. 27th. The record states that the patient occasionally has slight chills; the headache and pain in the ear are entirely gone; the œdema has almost disappeared, and there is only a trace of tenderness over the emissary vein. She reports herself as "feeling well," and talks about how soon she can go home. On account of the very high temperature she was ordered—

Sponge baths every two hours.

R. Quiniæ sulphatis..... gr. ij., every four hours, but as no effect from these could be seen at the end of forty-eight hours, they were omitted, and she was given

Champagne.....Oi. daily.

Dec. 2d. The tissues just in front of the sterno-cleido-mastoid muscle, which had been tender for three days, became painful, slightly swollen, and more dense than natural. The tenderness extended down to the clavicle. The only complaint was of the neck. There was no other pain anywhere. Slight chills recurred frequently.

Dec. 4th. There was a broad band of induration, without well-defined edges, running down the right side of the neck, from the mastoid to the clavicle, for which a poultice was applied.

Dec. 5th. This induration of the neck was less in its upper portion, but just above the clavicle it was broader, and extended slightly onto the chest, and the next day there was a circumscribed swelling, with redness and great tenderness, over the middle of

the clavicle. Although the chills recurred at frequent intervals, the strength and general condition were as good as ten days before, and she always replied that she "felt very well."

Dec. 7th. There was slight delirium for the first time.

Dec. 8th. The respiration was short and rapid, 40 per minute, and she was much weaker, with slight delirium and rapid loss of strength. She died on Dec. 9th, twenty days after entering the hospital.

The autopsy was made by Dr. E. G. Cutter, pathologist of the hospital, seven hours after death.

The body was well nourished, but rather cyanotic. There was a distinct swelling over the clavicle, which, on section, was found to contain bloody pus under the skin and among the muscles. On dissecting up the periosteum of the skull, pus exuded in considerable quantity from the foramen of the right emissary vein, and the tissues at the base of the skull were infiltrated with pus. The sulcus of the right lateral sinus was denuded and slightly carious on its surface, the carious bone extending forward to the cavernous sinus. In the tympanic roof was a small carious opening, one-eighth of an inch in diameter, communicating with the tympanum.

The right lateral sinus contained a softened thrombus, and its walls were purulent. The dura mater beneath this sinus was elevated by a thin bloody pus. The dura and pia mater were both slightly discolored for a small space over the carious spot in the tympanic roof. The amount of blood in the pia mater was about normal. There was no disease of the great centres.

The acini of the liver were indistinct, and the organ was flabby, soft, and in a state of parenchymatous degeneration. In the left lung were several localized engorgements, and in the posterior part of the middle lobe of the right lung was an embolic abscess, while the lower lobe of the same lung was somewhat solidified.

Both kidneys were large, pale, and yellowish, with the tubules extremely cloudy. The spleen was large and flabby; its pulp was hyperplastic, and showed numerous small hemorrhages. The stomach and intestines were normal.

The accompanying table of the temperature, taken at intervals of two hours throughout nearly the whole course of the disease,



and of the pulse taken twice daily, gives the only important features of the case not mentioned in the history.

Before entering the hospital, the only symptoms were chronic otorrhœa of many years' duration, and recent pain in the ear, with vertigo, and vomiting. After entrance the subjective symptoms were pain in the ear, mastoid, and at the top of the head, with irregularly recurring chills, and a very variable temperature, as can be seen in the table; the objective symptoms were great tenderness of the mastoid bone, and tenderness, with œdematous swelling, along the edge of the base of the skull, but without fluctuation; later in the disease there was swelling and induration down the neck to the clavicle.

The case offers a number of points of special interest, the most prominent of which was the œdematous swelling and extreme tenderness over the foramen of the emissary vein, which led to the suspicion, stated at the time to a number of the medical class, of already existing phlebitis of the lateral sinus. The two chills on the preceding day would have led one to fear an infection of the general system, but without the external manifestation of the œdema and sensitiveness it would have been impossible to have defined and localized it, and, moreover, the chills could have readily been referred to the acute inflammation of the mastoid cells, which certainly existed, as shown by the sensitiveness of the mastoid bone. I advised the operation of opening the mastoid cells without any expectation of influencing the phlebitis, if it already existed, but considering it indicated by the tenderness of the bone itself, and by the severe pain in the ear, and giving the patient the benefit of the doubt in regard to the phlebitis. The relief from the operation was most marked, for not only was the pain in the ear, mastoid, and head completely relieved for the rest of her life, but there was a decided diminution in the swelling and tenderness along the base of the skull.

The recurring chills, with the very sudden rises and falls of the temperature, showed that, however well the local ear disease was progressing, pyæmia was running its course. The chills and

variable temperature were absolutely the only symptoms of the general disease for seventeen days; there was apparently during that time no loss of strength or appetite, not the slightest delirium, and the patient always reported that she "felt well." Thirty-six hours before death respiration became very rapid, from the emboli in the lungs, and mild delirium set in.

The table is interesting as showing the very sudden rises and falls of temperature, and the extreme variations characteristic of pyæmia.

Several points of the autopsy are worthy of attention. The removal of the periosteum from the external surface of the skull, which necessarily cut across the emissary mastoid vein, showed large quantities of pus exuding from the venous foramen; the muscular tissues in the neighborhood were infiltrated with pus, but there was no collection at any one point forming an abscess. The induration along the sterno-mastoid muscle was apparently due to a similar infiltration by gravitation, although this was not determined accurately by dissection on account of the impossibility of so doing without defacing the body. I had supposed during life that the symptoms in the neck were due to phlebitis of the internal jugular vein by extension from the lateral sinus, but examination of the sinuses did not confirm this, the phlebitis ceasing before it reached the jugular, and no signs of inflammation being visible in that part of the jugular which could be examined from within the skull. The caries in the roof of the tympanum was wholly unconnected with the phlebitis, the dura mater, although slightly discolored over it, being free from all inflammation at that point.

It was impossible to remove the petrous bone for dissection, but it was very evident that there was inflammation and caries within the mastoid cells and tympanum, that this inflammation had excited the phlebitis of the lateral sinus, probably through the minute foramina communicating between the mastoid cells and the sulcus of the sinus. At the time of the operation there was inflammation both of the mastoid and of the sinus, the former of which was relieved by the operation, but the latter ran its course, and ended in pyæmia.

In some particulars this case differs very decidedly from the three previously reported. In all of those cases the external manifestation of the internal disease consisted of a hard induration of the superficial tissues of the neck, of greater or less extent, which, in one case, was incised after it had existed for a considerable time, and the tissues were found to be infiltrated with pus. In this last case there was no such induration, but an inflammatory edema. In all of the cases there was great tenderness over the affected part. The difference in the cases was probably due to the existence in the previous cases of an early obstruction to the circulation from thrombus, and a slow suppuration in the tissues, while in the last case there was either slight obstruction to the circulation or an early suppuration; in other words, in the three former cases the thrombosis was more prominent than the phlebitis, while in the last case the phlebitis predominated. In the first series of cases the induration existed for a considerable time without any change in the pulse and temperature, or any affection of the general system; in the last case there was no induration around the emissary vein, and the general system was affected almost at the beginning.

	Temp. F.	Pulse.			Temp. F.	Pulse.
Nov. 18, A.M. ....	100.2			Nov. 26, 2 P.M. ....	103	
" 18, P.M. ....	101			" 26, 4 P.M. ....	104	
" 19, A.M. ....	100.7			" 26, 6 P.M. ....	105	108
" 19, P.M. ....	100.9	100		" 26, 8 P.M. ....	104	
" 20, A.M. ....	99	72	Chill.	" 27, 8 A.M. ....	103.2	120
" 20, P.M. ....	105.2	118	Chill.	" 27, 10 A.M. ....	104	
" 21, A.M. ....	100	80		" 27, 12 M. ....	104	
" 21, P.M. ....	101	92	Operation.	" 27, 2 P.M. ....	104	
" 22, A.M. ....	100	80		" 27, 4 P.M. ....	104	
" 22, P.M. ....	101	90		" 27, 6 P.M. ....	104.6	128
" 23, A.M. ....	103.8	98	Chill.	" 27, 8 P.M. ....	104	
" 23, P.M. ....	101.2	98		" 28, 8 A.M. ....	101	110
" 24, A.M. ....	103.8	108		" 28, 10 A.M. ....	104	
" 24, P.M. ....	103.2	100		" 28, 12 M. ....	104	
" 25, 8 A.M. ....	104	112		" 28, 2 P.M. ....	106	
" 25, 9 A.M. ....	102			" 28, 4 P.M. ....	105.2	
" 25, 10 A.M. ....	104			" 28, 6 P.M. ....	104.8	120
" 25, 2 P.M. ....	103			" 28, 8 P.M. ....	104	
" 25, 4 P.M. ....	99	110		" 28, 10 P.M. ....	103	
" 26, 8 A.M. ....	100	100		" 28, 12 P.M. ....	101	
" 26, 10 A.M. ....	100.4			" 29, 2 A.M. ....	100	
" 26, 12 M. ....	105			" 29, 4 A.M. ....	101	



	Temp. F.	Pulse.			Temp. F.	Pulse.	
Nov. 29, 6 A.M....	103.2				Dec. 3 12 P.M....	100.3	
8 A.M....	103	120			" 4, 2 A.M....	101.4	
10 A.M....	101				4 A.M....	100	
12 M.....	103				6 A.M....	100.2	
2 P.M....	104				8 A.M....	98	100 Chill.
4 P.M....	105				10 A.M....	103	
6 P.M....	104.8	118			12 M.....	105	
8 P.M....	101				2 P.M....	104.2	
10 P.M....	97.8				4 P.M....	102	Chill.
12 P.M....	98				6 P.M....	102	
" 30, 2 A.M....	104				8 P.M....		
4 A.M....	104				10 P.M....		
6 A.M....	105				12 M.....		
8 A.M....	104	118			" 5, 3 A.M....	98	
10 A.M....	103				6 A.M....	102	
12 M.....	101		Chill.		8 A.M....	101	112
2 P.M....	98				10 A.M....	105	
4 P.M....	104				12 M.....	101	
6 P.M....	104.6	116	Chill.		2 P.M....	101	Chill.
8 P.M....	105.6				4 P.M....	105	
10 P.M....	105				6 P.M....	104	124
12 P.M....	102				8 P.M....	102	
Dec. 1, 2 A.M....	98				10 P.M....		
4 A.M....	98.2				12 P.M....		
6 A.M....	100				" 6, 4 A.M....	99	Chill.
8 A.M....	102.3	120			6 A.M....	102	
10 A.M....	105.3				8 A.M....	101	120 Chill.
12 M.....	105				10 A.M....	102.3	
2 P.M....	105.2				12 M.....	102.9	
4 P.M....	104				2 P.M....	100	
6 P.M....	101	124			4 P.M....	98.1	Chill.
8 P.M....	100				6 P.M....	102.9	120
10 P.M....	97.4				8 P.M....	100.8	
12 P.M....	100				" 7, 8 A.M....	104	120
" 2, 2 A.M....	99				10 A.M....	101.9	
4 A.M....	99				12 M.....	98.9	
6 A.M....	99		Chill.		4 P.M....	98.8	
8 A.M....	105	130			6 P.M....	102	130
10 A.M....	104				8 P.M....	106	
12 M.....	106				10 P.M....	104.9	
2 P.M....	102.2				12 P.M....	103	
4 P.M....	102.9				" 8, 2 A.M....	103	
6 P.M....	103	124			4 A.M....	103.9	
8 P.M....	102				6 A.M....	103	
10 P.M....	102.2		Chill.		8 A.M....	103.1	128
12 P.M....	104				10 A.M....	102.2	
" 3, 2 A.M....	101				12 M.....	105	
4 A.M....	101.8				2 P.M....	103	
6 A.M....	98		Chill.		4 P.M....	104.8	
8 A.M....	101	112	Chill.		6 P.M....	104	128
10 A.M....	104				8 P.M....	102.6	
12 M.....	103.9				10 P.M....	102	
2 P.M....	101				12 P.M....	102.2	
4 P.M....	99.2				" 9, 3 A.M....	104	
6 P.M....	103.2	112			5 A.M....	104.9	
8 P.M....	102				7 A.M....	102	128
10 P.M....	102.9				8 A.M....	103	Death.









